

REMARKS

Claims 1-56 are pending in the subject application, including independent Claims 1, 39, and 54-56. By entry of the present Amendment, Claims 1, 39, 54-56 are hereby amended as set forth in the listing of the claims above. The Examiner is respectfully requested to enter the current amendment set forth above as placing the application in better condition for appeal, or as overcoming the Examiner's grounds for rejection and placing the application in condition for allowance.

Amendments

No new matter is included in the proposed amendments, which merely clarify the claims to avoid unexpected construction of certain terms. The amendments are supported, for example, by FIGURE 7 of the Applicant's specification, together with the descriptive text from page 18, line 4, through page 22. More particularly, examples of support may be found in the last paragraph of page 20 for the amendments to Claims 1, 39, 54 and 56, and in blocks 182, 184 and 186 of FIGURE 8 for the amendments to Claim 55.

Rejections Under 35 USC 102

The Examiner has repeated the rejection under 35 USC 102 of Claims 1-56 that was set forth in section 4 of the Office Action mailed March 15, 2004 ("the previous Office Action"). There, the Examiner rejected Claims 1-56 as anticipated by U.S. Patent 6,434,366 to Harrison, et al. ("Harrison"). The Examiner essentially contends that in an adaptive antennae weighting scheme, such as that taught by Harrison, each new weighting is a "function" of a plurality of previous weightings. That is, the Examiner notes that each preceding weighting affects the channel characteristics that are measured by the receiving station. As the next adaptive weighting is based upon such channel estimates, which are affected by the previous weighting, in the Examiner's view, it is a "function" of such previous weighting. Moreover, because adaptation is an iterative process, each new weighting is in some sense a function of not only a plurality of previous weights, but indeed of all previous weights.

Applicant respectfully disagrees with this assertion. The relationship between a new weight and a plurality of previous weights in a conventional adaptive weighting system, such as that described in Harrison, is very indirect. With iterative determination, no new weight is determined as an explicit mathematical function of a plurality of previous weights. Explicit mathematical determination is based only on the previous (or a particular previous) weight. The amendments currently proposed herein to independent Claims 1, 39 and 54 unambiguously exclude the sense in which the weights of Harrison could be called a "function" of

previous weights. For example, Claim 1, as proposed for amendment herein, recites in part (underlining added for emphasis):

(g) generating a new weight vector, w_{new} , based upon feedback received from the receiving unit, as an explicit mathematical function of the first and second test weight vectors.

It is respectfully submitted that the conventional adaptive antenna algorithm of Harrison does not, and would not, perform as required by the recitation in step (g) of amended Claim 1. While a conventional adaptive antenna algorithm might arguably calculate a new weight from a preceding weight, based on feedback, any second previous weight would contribute to such calculation, at most, in an indirect fashion, and not explicitly, as required by the amended claims.

Claim 39, as proposed for amendment herein, recites in part (underlining added for emphasis):

(g) generating a third complex number, based upon feedback received from the receiving unit, by concurrent mathematical manipulation of the first and second complex numbers;

It is respectfully submitted that Harrison does not, and would not, concurrently manipulate the first and second complex numbers, as required by amended Claim 39, to generate a third complex number. The reason is similar to that set forth above in regard to amendment of Claim 1. Even to the extent that a new weighting of complex numbers might arguably be based upon mathematical manipulation of previous complex numbers in a conventional adaptive weighting system (such as disclosed by Harrison), a plurality of such previous complex numbers would not (and are not, in Harrison) be concurrently manipulated. Rather, any such manipulation is sequential, in different time frames, and indeed for different “new” weight values.

Claim 54, as proposed for amendment herein, recites in part (underlining added for emphasis):

(e) generating a new weight vector, w_{new} , including selecting between the first and second test weight vectors based upon feedback received from the receiving unit, wherein the new weight vector is a function of the first and second test weight vectors;

It is respectfully submitted that Harrison does not select between previously used weight vectors as part of the step of generating a new weight vector. The procedure of Harrison has no step that involves using feedback to select between previous weight vectors.

Claim 55 is a different matter, because it is directed to a receiver providing feedback, rather than to a transmitter receiving feedback. Claim 55, as proposed for amendment herein, recites in part (underlining added for emphasis):

(d) transmitting a solitary information unit that indicates whether the power of the radio waves received during the first time period is greater than the power of the radio waves received during the second time period according to the comparison of step (c).

It is respectfully submitted that Harrison does not disclose transmitting such a solitary information unit. Nor would there be any reason for Harrison to do so, for at least two reasons. First, the weightings in Harrison are calculated based upon channel estimates. Power, therefore, is of only tangential interest. Second, the weighting calculations in Harrison are sequential, and do not involve the results of comparison of two previous time periods. For these reasons, Applicant respectfully submits that the method defined by Claim 55, as amended by the proposed amendment, is nonobvious in view of Harrison, or any of the prior art cited by the Examiner.

Claim 56, as proposed for amendment herein, recites in part (underlining added for emphasis):

(d) receiving a single information bit as feedback from the receiving unit;
(e) adjusting amplitude and phase of a plurality of radio carrier signals based upon the feedback conveyed by a value of the single information bit;

It is respectfully submitted that the recitation of clauses (d) and (e) of Claim 56, as proposed above, clarifies the "single bit of feedback" as originally intended, precluding feedback that requires two or more bits of information to be conveyed. Thus, the requirements of these steps are not taught or suggested by Harrison, which at least tacitly requires numerous bits of information to be conveyed. The advantage that may be provided by such modest feedback data rates, particularly in bandwidth-limited systems, will be apparent to the Examiner.

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Conclusion

The remarks set forth above support a conclusion that the amendments proposed herein overcome the Examiner's grounds for rejection, thereby rendering each independent claim nonobvious over the cited prior art. Accordingly, each dependent claim is also nonobvious over the cited prior art, at least by virtue of properly depending from one of the independent Claims 1 or 39. As such, the proposed amendments are believed to place the subject application into condition for allowance. The Examiner is therefore respectfully requested to enter the proposed amendments as placing the application into condition for allowance, and to issue a notice of allowability in due course. If the Examiner declines to enter the proposed amendment as placing the application into condition for allowance, then he is respectfully requested to enter the proposed amendment to place the application into better condition for appeal.

If telephonic communication might be advantageous to resolve any remaining issues, the Examiner is encouraged to contact the undersigned by telephone.


The Commissioner is authorized to construe this paper as including a petition to extend the period for response by the number of months necessary to make this paper timely filed. Fees or deficiencies required to cause the response to be complete and timely filed may be charged, and any overpayments should be credited, to our Deposit Account No. 50-0490.

Respectfully submitted,

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